Opportunities and Adoption Challenges of AI in the Construction Industry: A PRISMA Review

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Abstract

Artificial intelligence (AI) is a powerful technology with a range of capabilities, which are beginning to become apparent in all industries nowadays. The increased popularity of AI in the construction industry, however, is rather limited in comparison to other industry sectors. Moreover, despite AI being a hot topic in built environment research, there are limited review studies that investigate the reasons for the low-level AI adoption in the construction industry. This study aims to reduce this gap by identifying the adoption challenges of AI, along with the opportunities offered, for the construction industry. To achieve the aim, the study adopts a systematic literature review approach using the PRISMA protocol. In addition, the systematic review of the literature focuses on the planning, design, and construction stages of the construction project lifecycle. The results of the review reveal that (a) AI is particularly beneficial in the planning stage as the success of construction projects depends on accurate events, risks, and cost forecasting; (b) the major opportunity in adopting AI is to reduce the time spent on repetitive tasks by using big data analytics and improving the work processes; and (c) the biggest challenge to incorporate AI on a construction site is the fragmented nature of the industry, which has resulted in issues of data acquisition and retention. The findings of the study inform a range of parties that operate in the construction industry concerning the opportunities and challenges of AI adaptability and help increase the market acceptance of AI practices.